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10/665,831	09/19/2003	Gregory J. May	200300696-1	6035

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EXAMINER	
MOON, SEOKYUN	

ART UNIT	PAPER NUMBER
2629	

DATE MAILED: 08/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/665,831	MAY, GREGORY J.	
	Examiner	Art Unit	
	Seokyun Moon	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to **claims 1**, **3**, **7**, **25**, **35**, **36**, and **37** have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claims 1**, **3-8**, **10-16**, **19-23**, **25-32**, and **34-37** is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi (U.S. Pat. No. 6,819,064 B2) in view of Doany et al. (U.S. Pat. No. 5,517,340, herein after referred to as "Doany").

As to **claim 1**, Nakanishi teaches an optically addressable display ("*display system*") [figs. 1 and 6] comprising:

a projection device (a combination of "*light source 1*", "*color switch filter unit 31*", "*intensity switch filter unit 32*", and "*spatial light modulator 2*" shown in fig. 6) including,

a mechanism (a combination of "*light source 1*" and "*color switch filter unit 31*") to create emissions having various color channels [col. 1 lines 30-33];

a data encoder ("*digital micro-mirror device*", herein after referred to as "*DMD*" included in the "*spatial light modulator 2*") to apply data for each of the color channels [col. 1 lines 33-35 and lines 44-49] and;

a screen ("*screen 4*" shown in fig. 6) including,

a plurality of pixels for producing a color display [col. 1 lines 47-49].

Nakanishi inherently teaches / discloses the plurality of pixels to include a plurality of receptors activating the pixels since it is required for Nakanishi to activate the pixels to display images on the screen of the display according to the lights of different color elements transmitted by "*DMD*" [col. 1 lines 33-35 and lines 47-49].

Nakanishi does not expressly teach the emissions created by the mechanism to have plural polarizations defining a corresponding number of color channels.

However, Doany [fig. 3] teaches a projection display including a polarized color wheel ("*color wheel 28*") generating a polarized emission for each of plural colors [col. 3 lines 6-16 and 39-60].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Nakanishi's color wheel such that each portion of Nakanishi's color wheel representing a color to have a polarization, and to include an additional polarization filter ("*polarization filter 30*" shown in fig. 3) in Nakanishi's display, as taught by Doany, in order to filter out the light misreflected by Nakanishi's spatial light modulator, by synchronizing the polarization filter with the polarization of the color wheel, thus to optimize Nakanishi's image display [col. 6 lines 42-50].

As to **claim 3**, Nakanishi as modified by Doany teaches the display ("*display system*"), wherein the mechanism (the modified combination of Nakanishi's "*light source 1*" and Doany's "*color wheel 28*") to create emissions further comprises:

a source (Nakanishi: "*light source 1*") [figs. 1 and 6] producing visible spectrum emission (Nakanishi: "*white light*") [Nakanishi: col. 1 lines 30-33]; and

a polarization filter (Doany: "*color wheel 28*" shown in fig. 3) to sequentially polarize the visible emissions (Nakanishi: "*white light*") to produce said emissions of plural polarizations as

sequentially polarized emissions; wherein said data encoder (Nakanishi: "*DMD*") sequentially applies data for the multiple color channels on a channel-by-channel basis to the sequentially polarized emissions [Nakanishi: col. 1 lines 30-33 and lines 61-67].

As to **claim 4**, Doany [fig. 3] teaches the polarization filter ("*color wheel 28*") being a multi-segment filter, each segment corresponding to a different one of multiple polarization phases [col. 3 lines 6-16]

As to **claim 5**, Nakanishi as modified by Doany [Doany: fig. 3] teaches the multi-segment filter to comprise a rotating filter disposed in the path of the emissions to sequentially polarize the emissions through the multiple polarization phases [Nakanishi: col. 1 lines 58-67].

As to **claim 6**, Doany [fig. 3] teaches the polarization filter ("*color wheel 28*") being a rotating linear (polarizations in "s" or "p" directions) filter that sequentially polarizes the emissions through multiple polarization phase peaks ("s" or "p" directions) [abstract].

As to **claim 7**, the claim limitation regarding the receptors implemented in pixels has already been discussed with respect to the rejection of claim 1.

Nakanishi as modified by Doany [Doany: fig. 3] teaches the display, wherein each pixel comprises a multi-color physical element ("*receptors*") for displaying multiple colors (Doany: "*R*", "*G*", and "*B*"), and wherein different ones of the multiple colors are encoded by bands near different ones of the multiple polarization phase peaks (Doany: phase peaks in polarization directions of "*s*" or "*p*").

As to **claim 8**, Doany [fig. 3] teaches the polarization filter ("*color wheel 28*") to comprise a circular polarization filter.

As to **claim 10**, the claim limitation regarding the receptors implemented in pixels has already been discussed with respect to the rejection of claim 1.

Nakanishi teaches the data encoder ("*DMD*") comprising an array of digital light processing mirrors (a plurality of "*micro-mirror*'s), each of the digital light processing mirrors selectively reflecting the emissions away from or toward a corresponding one or more of the receptors based upon the data [col. 1 lines 33-37 and 44-57].

As to **claim 11**, Nakanishi as modified by Doany teaches / discloses inherently the sequentially polarized emissions to comprise a single beam of emissions having a diameter that completely encompasses the array of digital light processing mirrors since Nakanishi teaches the "*micro-mirrors*" of "*DMD*" to respond to each of the picture elements, pixels, implemented on the screen [col. 1 lines 47-49], and thus requires the emissions to cover or encompass the total portion of the array of "*micro-mirrors*" of "*DMD*" to display a complete or a full image on the screen.

As to **claim 12**, the claim limitation regarding the receptors implemented in pixels has already been discussed with respect to the rejection of claim 1.

Nakanishi teaches the display comprising a separate mirror for each of the pixels [col. 1 lines 47-49].

As to **claim 13**, the claim limitation regarding the receptors implemented in pixels has already been discussed with respect to the rejection of claim 1.

Nakanishi as modified by Doany teaches the display (*Nakanishi*: "*display system*") wherein

each pixel is one of multiple colors (Nakanishi: "*R*", "*G*", or "*B*");

the polarization filter (Doany: "*color wheel 28*") sequentially polarizes the emissions into one of multiple polarization states, a separate polarization state corresponding to each the multiple colors [Doany: fig. 3] [Nakanishi: col. 1 lines 30-33]; and

each receptor included in a pixel is responsive to one of the multiple separate polarization states (since each pixel is responsive to one of the multiple colors while each of colors corresponds to one of multiple polarization states).

As to **claim 14**, Nakanishi teaches each of the digital light processing mirrors ("*micro-mirrors*" of "*DMD*") be positioned to reflect light away from its corresponding receptor in response to a data indicating that its corresponding pixel should be off [col. 1 lines 33-37].

As to **claim 15**, all of the claim limitations have already been discussed with respect to the rejection of claim 6.

As to **claim 16**, all of the claim limitations have already been discussed with respect to the rejection of claim 7.

As to **claim 19**, the claim limitation regarding the receptors implemented in pixels has already been discussed with respect to the rejection of claim 1.

Nakanishi as modified by Doany teaches the display (Nakanishi: "*display system*") comprising a projecting lens (Nakanishi: "*projection lens 3*") after the data encoder (Nakanishi: "*DMD*") to project the sequentially polarized emissions toward the plurality of pixels.

As to **claim 20**, the claim limitation regarding the receptors implemented in pixels has already been discussed with respect to the rejection of claim 1.

Nakanishi as modified by Doany discussed with respect to the rejection of claim 1 teaches each of the plurality of pixels to respond to a different polarization state of the emissions of plural polarizations and to produce one of multiple colors [Nakanishi: "*R*", "*G*", and "*B*") as a display.

As to **claim 21**, Nakanishi does not disclose expressly the plurality of pixels to comprise a plurality of light emitting diodes.

However, examiner takes official notice that using light emitting diodes for pixels implemented in a display screen is a well known in display technology.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use light emitting diodes for the pixel elements implemented in Nakanishi's display to provide bright light emissions for the display.

As to **claim 22**, Nakanishi discloses inherently each of the pixels to include light emitting diodes of at least three different colors since it is required for Nakanishi to include elements / components capable of emitting lights of colors corresponding to the color signals ("*R*", "*G*", and "*B*") embedded in an image signal shown on [*Fig. 9*] to display images on the screen of the display.

Nakanishi does not disclose the elements being light emitting diodes.

However, examiner takes official notice that using light emitting diodes for pixels implemented in a display screen is a well known in display technology.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use light emitting diodes for the pixel elements implemented in Nakanishi's display to provide bright light emissions for the display.

As to **claim 23**, Nakanishi teaches the data encoder to comprise an LCD shutter device ("*spatial light modulator 2*") [col. 4 lines 29-32].

As to **claim 25**, Nakanishi [col. 1 lines 29-43] teaches a method of encoding color data to activate an optically addressable display ("*display system*") including a plurality of pixels, the method comprising the steps of:

at a projection device (a combination of "*light source 1*", "*color switch filter unit 31*", "*intensity switch filter unit 32*", and "*spatial light modulator 2*" shown in fig. 6):

for each pixel, applying data to each of the emissions of different colors by selectively passing the emissions of different colors to the pixels;

at the optically addressable display:

at each pixel, producing a different display for each of the emissions of different colors when received [col. 1 lines 30-40].

Nakanishi does not teach producing emissions of different polarizations, applying emissions of different polarizations to pixels, and defining the pixels to produce a different display for different polarized emissions.

Doany [fig. 3] teaches a polarized color filter ("*color wheel 28*") used in a display [col. 3 lines 6-16 and 39-60].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Nakanishi's color wheel such that each portion of Nakanishi's color wheel representing a color to have a polarization, and to include an additional polarization filter ("*polarization filter 30*" shown in fig. 3) in Nakanishi's display, as taught by Doany, in order to filter out the light misreflected by Nakanishi's spatial light modulator, by synchronizing the polarization filter with the polarization of the color wheel, thus to optimize Nakanishi's image display [col. 6 lines 42-50].

As to **claim 26**, all of the claim limitations have already been discussed with respect to the rejection of claim 3.

As to **claim 27**, Nakanishi does not expressly disclose the emission being a laser emission.

However, since applicant has failed to disclose that using a laser for emission source provides an advantage, is used for particular purpose, or solves a stated problem, it is an obvious matter of design choice to use a laser as a light emission source in Nakanishi.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use any other light emitting source, including a laser, since other light emitting sources would perform equally well at emitting a light.

As to **claim 28**, all of the claim limitations have already been discussed with respect to the rejection of claim 3.

As to **claim 29**, all of the claim limitations have already been discussed with respect to the rejection of claim 4.

As to **claim 30**, all of the claim limitations have already been discussed with respect to the rejection of claim 4.

As to **claim 31**, Nakanishi as modified by Doany discloses the step of applying data comprising selectively shuttering the emissions of different polarization (since Doany's "*color wheel 28*" rotates such that the emitted light from the light source passes through a certain portion of the color wheel only at a time, wherein each of the plural portions corresponds to each of plural colors) [Doany: abstract lines 12-18].

As to **claim 32**, all of the claim limitations have already been discussed with respect to the rejection of claim 10.

As to **claim 34**, Nakanishi as modified by Doany teaches applying data to the emissions of different colors and polarizations sequentially (since each of colors corresponds to one of multiple polarization states in modified combined device of Nakanishi and Doany) [Nakanishi: col. 1 lines 33-37].

As to **claim 35**, most of the claim limitations have already been discussed with respect to the rejection of claims 1 and 20, except for applying data, on a pixel-by-pixel and channel-by-channel basis to the emissions by permitting emissions to reach a pixel indicated to be on by the data.

Nakanishi teaches applying data, on a pixel-by-pixel and channel-by-channel basis (applying "*R*", "*G*", and "*B*" in sequence) to the emissions by permitting emissions to reach a pixel in the optically addressable display indicated to be on by the data [col. 1 lines 33-37 and 47-57].

As to **claim 3**6, all of the claim limitations have already been discussed with respect to the rejection of claim 20 except for means for directing emissions of plural polarization states and means for selectively passing emissions of each of the plural polarization states.

Nakanishi modified by Doany teaches means (Nakanishi: "*spatially light modulator 2*") [Nakanishi: fig. 1] for directing emissions of plural polarization states toward an array of pixels; and

means (Doany: "*polarization filter 30*") [Doany: fig. 3] for selectively passing emissions of each of the plural polarization states according to applied data.

As to **claim 37**, all of the claim limitations have already been discussed with respect to the rejection of claim 20 except for means for receiving emissions of a plurality of polarizations and a method of encoding data onto each of the separate color data channels.

Nakanishi as modified by Doany teaches an optically addressable display comprising:

means (Nakanishi: "*screen 4*" shown in fig. 1) for receiving emissions of a plurality of polarizations, each of the plurality of polarizations corresponding to a separate color data channel [Doany: fig. 3]; and

wherein data is encoded onto each of the separate color data channels [Nakanishi: col. 1 lines 58-67].

4. **Claims 2, 24**, and **33** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi and Doany as applied to claims 1, 3-8, 10-16, 19-23, 25-32, and 34-37 above, and further in view of Morgan et al. (U.S. Pat. No. 6,453,067 B1, herein after referred to as "Morgan") and Marshall et al. (U.S. Pat. No. 5,706,061, herein after referred to as "Marshall").

Nakanishi as modified by Doany does not teach the data encoder receiving the emissions of plural polarizations simultaneously and applying data simultaneously for each of the multiple color channels to the emissions of different polarization.

However, Morgan [col. 3 lines 63-67 and col. 4 lines 1-6] discloses the data encoder (a portion of the "*three separate SLMs*") receiving the emissions of plural modulated signals simultaneously and applying data simultaneously for each of the multiple color channels to the emissions of different polarization (since each of colors corresponds to one of multiple polarization states in modified combined device of Nakanishi and Doany).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use three "*spatial light modulators*" instead of one for Nakanishi's display, as taught by Morgan, to apply all data signals simultaneously instead of sequentially and thus to provide a bright display environment for Nakanishi's display screen [Morgan: col. 4 line 5].

The combined device of Nakanishi and Doany as modified by Morgan does not expressly disclose the modulation process to comprise a polarization.

However, Marshall teaches the data encoders ("*SLMs*") modulating the incident light entering the spatial light modulators in its polarization in the environment of driving display apparatus using spatial light modulators [col. 1 lines 31-41].

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to specify the modulation process implemented in the modified combined device of Nakanishi, Doany, and Morgan being a polarization since the modulation process through

polarization requires less number of components and can be achieved with simple optical components such as polarization filters and thus reduces the required space for the modulation component in the display.

As to **claim 24**, most of the claim limitations have already been discussed with respect to the rejection of claims 1 and 2 except for applying data simultaneously on a pixel-by-pixel basis [Nakanishi: col. 1 lines 47-55].

5. **Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi and Doany as applied to claims 1, 3-8, 10-16, 19-23, 25-32, and 34-37 above, and further in view of Son et al. (U.S. Pat. No. 6,603,504 B1, herein after referred to as "Son").

The claim limitation regarding the receptors implemented in pixels has already been discussed with respect to the rejection of claim 1.

Nakanishi does not teach the data encoder comprising an array of light masks each corresponding to one or more the receptors, each of the light masks selectively blocking or permitting the emissions to pass to a corresponding one or more of the receptors based upon the data.

However, Son [fig. 10a] teaches light masks implemented in an array of light-projectors ("*light strip array projectors 55, 56, 57,* and, *58*") utilized in an image display system [col. 7 lines 3-8].

It would have been obvious to one of ordinary skill in the art at the time of the invention to include a plurality of light masks in Nakanishi's data encoder where each of the light masks corresponds to each of the receptors included in Nakanishi since Nakanishi's data encoder is a device / mean to project lights as Son's light-projectors, so that the light masks in Nakanishi's data encoder to illuminate the lights only to the corresponding respective pixel [*Col. 7 Lines 16-19*], and thus to provide clear images.

6. **Claim 17** is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi and Doany as applied to claims 1, 3-8, 10-16, 19-23, 25-32, and 34-37 above, and further in view of Vogeley et al. (U.S. Pat. No. 5,831,601, herein after referred to as Vogeley).

Nakanishi as modified by Doany does not teach a light absorber to absorb light reflected away from the receptors.

However, Vogeley [fig. 15] teaches a light absorber ("*66*") absorbing the reflected light which is not emitted to the screen of the display [col. 10 lines 1-4].

It would have been obvious to one of ordinary skill in the art at the time of the invention to include Vogeley's light absorber in Nakanishi as modified by Butler-Smith to block or absorb any unnecessary light emission for displaying an image on the screen, thus to allow the display to present clear images.

7. **Claim 18** is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi and Doany as applied to claim 13 above, and further in view of Tiao et al. (U.S. Pat. No. 6,227,669 B1, herein after referred to as "Tiao").

Nakanishi as modified by Doany does not teach an integrating rod to provide uniformity to the emissions produced by the source.

However, Tiao [fig. 1B] teaches an image display utilizing an integrating rod (a combination of "*glass rod integrator 25*" and "*lens 35*") for the emissions produced by the source.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use Tiao's integrating rod in Nakanishi modified by Doany to uniformize the light emitted by Nakanishi's light source and thus to improve the light emission efficiency of the display [col. 1 lines 35-38].

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seokyun Moon whose telephone number is (571) 272-5552. The examiner can normally be reached on Mon - Fri (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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